

Serial No. 10/729,288

AMENDMENTS TO THE SPECIFICATIONS

V. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, where the present invention is generally referred to with numeral 10, it can be observed that it basically includes two-sectioned frustro-conical roller assembly 20 with rollable sheet 40, as seen in figures 1 and 2.

Depending on the characteristics and dimensions of the vehicle's door to be protected, frustro-conical roller assembly 20 can include on or more frustro-conical roller members to substantially follow the upper contour of the door. In this application the door shown in figures 6 and 7 is used. For a completely square door only one roller member is needed. The one shown requires the use of two roller members since one portion is substantially horizontal and the other one is slanted. The dimensions of the frustro-conical members are selected so that the different linear advance of flexible rollable sheet 40 is taken into consideration as the distance from the pivoting axis of the door varies. In other words closer to this axis the distance that rollable sheet 40 has to travel is less than at the distal end of the door D.

Frustro-conical roller assembly 20 includes, in the preferred embodiment, frustro-conical roller members 22 and 122. As best seen in the cross-section represented in figure 2, roller member 22 has a larger diameter at the end 24. When it is installed, as seen in figures 6 and 7, end 24 is positioned to correspond with the distal end of door D. In the preferred embodiment, member 22 includes central through opening 30 that receives axle member 62. The dimensions of member 22 are selected to

Serial No. 10/729,288

1 take into consideration the longer advancement of rollable sheet section 42
2 towards end 24 with respect to end 28. Axle member 62 is rigidly
3 supported to horizontal upper frame portion U of a car door opening.
4 Spring member 82 is also housed within opening 30 to bias roller member
5 22. Spring member 82 is anchored to cylinder 98 of rolling-unrolling
6 supporting mechanism 80 at one end 84 and to axle 62 at the other end 86.
7 As roller member 22 is rotated by pulling rollable sheet section 42, torsion
8 energy is stored in spring member 82. This energy is later used to pull in
9 rollable sheet section 42.

10
11 Similarly, frustro-conical roller member 122 operates with spring
12 member 182 to store the necessary torsion energy to retrieve rollable sheet
13 section 142. The dimensions of member 122 are selected to take into
14 consideration the longer advancement of rollable sheet section 142 towards
15 lateral end 124 with respect to lateral end 128. Again, axle member 162 is
16 rigidly supported to upper inner portion I of a car door opening.

17
18 Rollable sheet 40 includes rollable sheet sections 42 and 142. Rollable
19 sheet section 42 (and 142) includes lateral ends 44, 45, 48 and 49 (and 144,
20 145, 148 and 149). Lateral end 45 (and 145) is straight and affixed to
21 frustro-conical roller member 22 (and 122). Lateral end 49 (and 149) is
22 straight. Lateral ends 44 and 48 (and 144 and 148) are cooperatively
23 curved. Lateral end 44 (and 144) extends for a predetermined longer
24 distance than lateral end 48 (and 148).

25
26 Mounting assembly 59 removably mounts lateral end 49 to upper
27 frame portion U of car door D. When a user open car door D, rollable
28 sheet 42 is unrolled substantially covering the area adjacent to the door's
29 opening. Mounting assembly 159 removably mounts lateral end 149 to the

Serial No: 10/729,288

1 upper inner portion I of car door D. When a user opens car door D,
2 rollable sheet 142 is unrolled substantially covering the area adjacent to the
3 door's opening. Mounting assemblies 59 and 159 may be implemented
4 with hooks and rings or with any male and female hook members such as
5 ~~Velcro~~VELCRO. ~~Velcro~~VELCRO is a trademark of ~~Velcro~~VELCRO
6 Industries B.V., a limited liability company of Netherlands.

7
8 In the preferred embodiment, rollable sheets 42 and 142 are
9 contiguous and include zipper assembly 50 for releasably joining lateral
10 end 48 of rollable sheet 42 with lateral end 144 of contiguous rollable sheet
11 142. Lateral ends 48 and 144 may also include, in another preferred
12 embodiment, male and female hook means 58 and 158, respectively.
13 Figure 2 best shows slider assembly 50 for joining lateral end 48 and 144.

14
15 Rollable sheet sections 42 and 142 may also be joined with other
16 means such as a ~~Ziploc~~ZIPLOC or ~~Velcro~~VELCRO. ~~Ziploc~~ZIPLOC is a
17 trademark of S.C. Johnson Home Storage, Inc. a Delaware corporation.

18
19 Axle 60 has two sections including axle members 62 and 162 with the
20 same shape and dimensions. Axle member 62 includes ends 64 and 68, and
21 is fixedly mounted to horizontal upper frame portion U of a car door
22 opening. Axle member 62 passes through central opening 30 of horizontal
23 frusto-conical roller section 22. Axle member 162 includes ends 164 and
24 168, fixedly mounted to upper inner portion I of the car door opening.
25 Axle member 162 passes through central opening 130 of frusto-conical
26 roller section 122.

27
28 Spring member 82 (and 182) is mounted to end 24 (and 124) of
29 frusto-conical roller member 20 (and 120) and to axle member 62 (and

Serial No. 10/729,288

1 162), as best seen in figure 5. Spring member 82 (and 182) urges rollable
2 sheet member 42 (and 142) to roll back after being rolled out. Rolling-
3 unrolling supporting mechanism 80 (and 180) includes, in the preferred
4 embodiment, spring member 82 (and 182) and bushing member 90 (and
5 190). Bushing member 90 (and 190) includes peripheral ridge 92 (and 192),
6 central through opening 94 (and 194), rib 96 (and 196) and cylinder 98 (and
7 198). Spring member 82 (and 182) is mounted to axle member 62 (and
8 162). Spring member 82 (and 182) includes ends 84 and 86 (184 and 186).
9 End 84 (and 184) is fixed to a predetermined point of axle member 62 (and
10 162). End 86 (and 186) is fixed to cylinder 98 (and 198) of bushing member
11 90 (and 190). Axle member 62 (and 162) passes through the center of
12 spring member 82 (and 182) and through opening 94 (and 194). Peripheral
13 ridge 92 (and 192) removably engages in notch 22 (and 125) of frusto-
14 conical roller section 22 (and 122). Rib 96 (and 196) is removably mounted
15 to peripheral channel 26 (and 126). When the user pulls outer lateral end
16 49 (and 149) of rollable sheet section 42 (and 142), roller section 22 (and
17 122), fixed to bushing member 90 (and 190), rotates. Then, spring 82 (and
18 182) is torqued. The weight of the car door is greater than the spring
19 torque, so rollable sheet section 42 (and 142) will be rolled up only when
20 the car door is closed or rollable sheet section 42 (and 142) is removed from
21 car door D.

22

23 The foregoing description conveys the best understanding of the
24 objectives and advantages of the present invention. Different embodiments
25 may be made of the inventive concept of this invention. It is to be
26 understood that all matter disclosed herein is to be interpreted merely as
27 illustrative, and not in a limiting sense.

28